

order to further develop HTN education in the ED, and realize the potential to improve outcomes of patients with HTN.

199 No Difference in Emergency Department Length of Stay for Limited English Proficiency Patients With Language Disparities

Wallbrecht J, Hodes-Villamar L, Weiss S, Ernst A/University of New Mexico, Albuquerque, NM

Background: The population of the United States continues to diversify with an increasing percentage of homes with limited English proficiency (LEP). A major concern facing emergency departments (EDs) around the country is increasing length of stay (LOS). While multiple studies have shown racial and ethnic disparities in waiting time and length of stay (LOS), no studies have examined specifically if LEP patients have a different LOS than English-speaking (ES) patients. We hypothesized that there was a significant difference in LOS when comparing LEP and ES patients.

Methods: This is a prospective cohort study with LOS data collected from a Level I ED patient tracking software. Data was collected prospectively over a 60-day study period by randomly selecting from registered patients currently in the ED every day during October and November 2011. An average of 2 LEP and 2 English speaking patients with similar triage levels were selected each day. Data was collected on all LEP patients and a sampling of English speaking patients for comparison. In our ED the primary language preferred by the patient is indicated at the time of triage and registration. The patients' demographic data, ED visit information and LOS were prospectively entered into an Excel spreadsheet. Percentages were compared using 95% confidence intervals. LOS was analyzed using a student's T-test. With greater than 100 subjects per group our study had 80% power (or a power of 0.8) to determine a 15% difference in proportions between groups or a difference of 120 minutes (assuming a standard deviation of 300 minutes on both means).

Results: Data was collected from a total of 121 ES and 124 LEP patients. Among the LEP group were the languages of Spanish, Navajo, Vietnamese, Chinese, Arabic, and American Sign Language. 52% of LEPs used an interpreter. There were no differences between ES and LEPs in age (41 ± 22 versus 41 ± 22), sex (41% versus 52%), mode of arrival (ambulance-29% versus 23%), chief complaints, acuity, % admitted (29% versus 31%), % pediatrics (17% versus 19%) or in percentage with government insurance (Medicaid/Medicare-41%vs34%). More LEPs were self pay (36% versus 20%, $\text{diff}=16$, 95%CI=2,31). There were no differences in mean LOS from time of arrival to time to being seen by a provider when comparing ESs to LEPs (363 ± 374 versus 359 ± 343 mins) or time of arrival to discharge or admission request (840 ± 605 versus 837 ± 629 minutes).

Conclusion: Despite the possibility of increased delays in care and health care access disparities in emergency departments for LEPs, there was no difference in length of stay for LEPs.

200 Changes in Costs of Hospitalizations of Adults Aged 18-64 Through the Emergency Department For Ambulatory Care Sensitive Conditions: 2003-2009

Dresden S, Feinglass J, Kang R, Adams J/Northwestern University Feinberg School of Medicine, Chicago, IL

Study Objectives: Ambulatory care sensitive conditions (ACSCs) are conditions for which timely outpatient care may prevent hospitalization. The objective of this study was to compare the cost of hospitalizations for ACSCs through the emergency department (ED) from 2003-2009. We compared estimated nationwide changes in total and per capita costs for patients aged 18-64 by payer.

Methods: Nationally representative weighted estimates of costs of hospitalizations through the ED for ACSCs for patients aged 18-64 were calculated using the 2003 and 2009 Nationwide Inpatient Sample (NIS), an annual 20% cross-sectional sample of US hospital discharges. Costs were adjusted for inflation and reported in 2009 dollars. We defined ACSCs using the Agency for Health care Research and Quality's (AHRQ) Prevention Quality Indicators. We converted charges to costs using AHRQ's Health Care Utilization Project cost to charge ratio file. Costs for all patients, and patients with Medicaid, private insurance, or no insurance were compared by year using the Wald test with linear variance adjustments for complex sampled data. Using direct standardization with the 2010 US Census as a reference population and data from the 2003 and 2009 Current Population Surveys as age 18-64 enrollment denominators, we determined age/sex standardized per capita costs by year for each payer category.

Results: For patients aged 18-64, the number of hospitalizations through the ED for ACSCs remained relatively stable over the study period totaling 1.3 million in 2003 (15% of ED admissions) and 1.4 million (14% of ED admissions) in 2009 ($p=0.54$). Expressed in 2009 dollars, the cost of these hospitalizations was \$9.3 billion in 2003 and \$10.7 billion in 2009 ($p=0.08$). Costs increased from \$85 million to \$1.7 billion ($p<0.001$) for uninsured patients, but were relatively stable for Medicaid patients (\$2.5 billion to \$2.7 billion - $p=0.34$), and for privately insured patients (\$3.1 billion to \$3.2 billion - $p=0.92$). The age/sex standardized per capita cost of these hospitalizations was stable at \$24 per person for privately insured people, rose from \$32 to \$42 per person for uninsured people, and fell from \$337 to \$206 per person for Medicaid beneficiaries between 2003 and 2009. Over the study period enrollment in private insurance decreased by 3%, the number of uninsured people increased by 21%, and the number of Medicaid beneficiaries increased by 56% for this age group.

Conclusion: Hospitalizations for ACSCs accounted for 14% of all admissions through the ED for patients aged 18-64, but represented over \$10 billion in hospital costs nationwide in 2009, which was not statistically different from 2003. From 2003-2009, these costs rose 75% for uninsured patients. This cannot be fully explained by the increased number of uninsured people as the standardized per capita costs rose by 31% as well. While the Medicaid per capita cost fell by 39%, this decrease was due to increased enrollment rather than decreased costs, and it remained 8.5 times the rate for privately insured people. Implications: Given that hospitalizations for ACSCs may be preventable, increasing access to outpatient care might reduce future costs. In contrast, impeding patients' access to the ED would not likely be a safe strategy to reduce costs in patients like these who are ultimately hospitalized.

201 Predictive Validity of Emergency Department Crowding Measures for Inpatient Mortality

Sun B, Gabayan G, Chiu V, Yiu S, Derosé S/Oregon Health and Science University, Portland, OR; UCLA, Los Angeles, CA; Kaiser Permanente Southern California, Pasadena, CA

Study Objectives: Emergency department (ED) crowding is prevalent, and existing research suggests that ED crowding is associated with increased patient mortality. However, prior studies are limited by small hospital samples, inclusion of specific patient subgroups, and inadequate case mix adjustment; furthermore, studies are not directly comparable because of different measures of ED crowding. As a result, the external validity and causal mechanisms of ED crowding measures are unclear. Identification of valid metrics is critical for the proper design of public reporting and pay-for-performance initiatives. Our aim was to assess the predictive validity of multiple ED crowding measures for inpatient mortality.

Methods: We performed a retrospective cohort study using data from a regional, integrated health system (Kaiser Permanente Southern California- KPSC). We included ED visits from 2008 to 2010 occurring at 13 KPSC hospitals which resulted in hospital admission. All hospitals had implemented a systemwide, electronic medical records system during the study period. Exclusion criteria included age<18 years, visits by non-members, transfers to other hospitals, discharges from the ED, and patients receiving observation status care. The outcome was inpatient mortality. The unit of analysis was an ED visit. We assessed system- and visit-level measures of ED crowding. System metrics included exposures to ED occupancy and external length of stay, both at ED arrival and averaged over an index visitor's length of stay (LOS). Visit metrics included waiting, evaluation, and boarding time, as well as total LOS, experienced by an index visitor. To assess for non-linear effects, all ED crowding measures were categorized into quintiles. Hierarchical logistic regression models accounted for visit clustering by hospital and person. Covariates included demographic characteristics, 29 pre-existing co-morbidities noted from health service records in the preceding year, Emergency Severity Index triage level, triage vital signs, primary hospital diagnosis, time variables for year, month, day, and shift, and ED site.

Results: The study cohort included 326,487 ED visits resulting in hospitalization by 201,036 unique patients. Prior to covariate adjustment, all system metrics, boarding time, and total LOS were predictive of inpatient mortality ($p<0.05$). In adjusted analyses, boarding time was strongly predictive of mortality, with a threshold effect seen at 1.6 hours (1.7-2.8 hours, OR: 1.1, 95%CI: 1.02, 1.2; >2.9 hours, OR: 1.2, 95%CI: 1.1, 1.3). None of the other system or person-level metrics predicted inpatient mortality after covariate adjustment ($p>0.3$).

Conclusion: Surprisingly, system measures of ED crowding and most visit-level time intervals were poorly predictive of mortality, suggesting that threats to patient

safety is driven by the experience of boarding rather than general exposure to ED crowding. Our findings suggest that measurement efforts and patient safety interventions should focus on boarding time. Other potential measures may be confounded by patient case mix or hospital level factors.

202 Emergency Department Boarding Practices For Psychiatric and Non-Psychiatric Visits

Nolan J, Fee C, Blegen M, Cooper BA, Rankin SH/University of California, San Francisco, San Francisco, CA

Study Objectives: Emergency department (ED) boarding, particularly for psychiatric patients, is characterized as contributing to ED crowding, but no published quantitative analyses describe the extent of this practice nationally. We aim to describe the proportion of psychiatric and non-psychiatric visits to U.S. EDs that result in boarding and their median and 90th percentile boarding times.

Methods: We utilize data from the 2008 National Hospital Ambulatory Medical Care Survey, a national probability sample of visits to U.S. EDs. We define those with ED lengths of stay >6 hours as boarded, and boarding time as ED length of stay minus 6 hours. Visits with International Classification of Diseases-9 codes corresponding to the Health Care Cost and Utilization Project Mental Health and Substance Abuse Clinical Classifications Software codes are defined as psychiatric related. The main dependent variables are the proportion of boarded psychiatric and non-psychiatric patients and their median and 90th percentile boarding times. Independent variables include patient (age, residence, expected source of payment), hospital (region, metropolitan statistical area [MSA] status, ownership [voluntary non-profit, government non-Federal, proprietary], ambulance diversion hours, and safety-net status [Centers for Disease Control definition]), and community (urban-rural classification of patient ZIP code) characteristics. Bivariate analyses determine boarding proportions among psychiatric and non-psychiatric related visits by patient, community, and hospital characteristics using design-adjusted Pearson's chi-square tests. Results are presented as proportions, medians and 90th percentiles with 95% confidence intervals.

Results: Overall, 11% of ED visits resulted in boarding (21.5% of psychiatric, 10.3% of non-psychiatric). Psychiatric related visits demonstrate higher proportions of boarding than non-psychiatric among all patient, community, and hospital variables. Several variables demonstrate significantly higher boarding proportions within categories: region (Northeast 30.6%, $p=.045$ for psychiatric; 13.6%, $p=.02$ for non-psychiatric); MSA status (MSAs 23.8%, $p<.001$ for psychiatric; 11.4%, $p<.001$ for non-psychiatric); ownership (government non-Federal 29.6%, $p=.006$ for psychiatric; 12.9%, $p=.004$ for non-psychiatric); ambulance diversion hours (≥ 500 hours 31.3%, $p<.001$ for psychiatric; 16.4%, $p<.001$ for non-psychiatric); age (≥ 75 years 18.9%, $p<.001$ for non-psychiatric); residence (all residences except private 19.3%, $p<.001$ for non-psychiatric); expected source of payment (insured group 11.8%, $p<.001$ for non-psychiatric); and urban-rural status (large central/fringe metro 25.7%, $p<.001$ for psychiatric; 12.9%, $p<.001$ for non-psychiatric). Psychiatric visits had longer boarding times with overall median boarding times of 102 minutes (95% CI, 93-110) for non-psychiatric versus 167 minutes (95% CI, 146-195) for psychiatric, and 90th percentile times of 503 minutes (95% CI, 455-562) for non-psychiatric versus 675 minutes (95% CI, 599-784) for psychiatric.

Conclusion: In 2008, high proportions of visits to U.S. EDs resulted in boarding with protracted boarding times that disproportionately affected psychiatric-related visits. Many patient, community, and hospital variables demonstrate significant within group differences in boarding proportions.

203 Reducing Cost at the End of Life by Initiating Transfer to Inpatient Hospice in the Emergency Department

DeVader TE, DeVader SR, Jeanmonod R/Kaweah Delta Medical Center, Visalia, CA; Arcadia University, Glenside, PA; St. Luke's Hospital and Health Care Network, Bethlehem, PA

Study Objectives: The objective of this study was to determine the cost savings associated with transferring patients directly from the emergency department (ED) to an inpatient hospice unit.

Methods: This is a retrospective cohort of patients who died at an inpatient hospice unit from July 1, 2008, to June 30, 2010. The study site was an academic tertiary Level-1 trauma center with approximately 75,000 ED visits annually. Using inpatient hospice unit admission records and the hospital's electronic medical record, the place of transfer initiation to the inpatient hospice unit was determined. The

places of transfer initiation included the ED, Intensive Care Unit (ICU), and the general medical floor. All patients admitted to the inpatient hospice unit during the specified time frame were eligible for inclusion in the study. Exclusion criteria included patients transferred to the inpatient hospice unit who were not admitted to the hospital from the ED, patients who were trauma alerts, patients who were enrolled in Hospice but transfer to the inpatient hospice unit was not completed, and patients who were admitted to the inpatient hospice unit from other hospitals. Cost and charges pertaining to the hospitalization were determined from financial records, with admission to ED to time of death comprising the time period assessed. All dollars were adjusted for inflation to 2010 dollars. Since data was not normally distributed, nonparametric statistical tests were utilized for median dollar comparisons. The study was deemed exempt by the institutional review board.

Results: A total of 372 patients met study criteria. Forty three patients were transferred directly from the ED to the inpatient hospice unit, 31 patients were transferred from the ICU to the inpatient hospice unit, 226 patients were transferred from the medical floor to the inpatient hospice unit and 72 patients had combined ICU and floor stays prior to transfer. Hospital charges were reduced in patients transferred from the ED (\$3,652) versus those transferred from all inpatient services (\$65,156, $p < 0.0001$). Although part of this can be attributed to room and board charges (median ED room and board charges \$0, median inpatient room and board charges \$26,591.13, $p < 0.0001$), there were also differences in charges for laboratory studies (\$783.54 versus \$3,440.13, $p < 0.0001$) and radiology studies (\$446.90 versus \$3,992.63, $p < 0.0001$). When the ED portions of the patients' stays were viewed independently of other hospital charges, the ED charges generated by patients transferred directly to an inpatient hospice unit were less than those who were admitted to the hospital prior to transfer (\$1,321.00 versus \$1,641.00, $p < 0.0001$). Total cost for the patient's hospital and inpatient hospice unit stay was also reduced for patients who were transferred to an inpatient hospice unit directly from the ED as opposed to those who were admitted to the hospital prior to transfer (\$3,347.35 versus \$11,119.90, $p < 0.0001$). All charge and cost differentials were accentuated when comparing patients with ICU stays to patients transferred directly from the ED (Table 1).

Table 1. Cost and charge differences for ED to IHU transfers versus patients spending any time in the ICU

	ED (N = 43)	ICU (N = 103)	p-value
	Median	Median	
Hospital Charges	3652.30	102020.00	<0.0001
Room & Board	0.00	57770.36	<0.0001
Emergency Dept.	1321.00	1850.87	<0.0001
Laboratory	783.54	7986.38	<0.0001
Radiology	446.90	6835.00	<0.0001
Miscellaneous	749.30	24447.10	<0.0001
Total Hospital Cost	751.47	16730.91	<0.0001

Conclusion: Initiating transfers to an inpatient hospice unit from the ED significantly reduces hospital charges (ED, room and board, laboratory, and radiology) and hospital costs with the most significant savings in those patients who spend any time in the ICU during their hospitalization.

204 Short-Term Readmission Following Discharge From California Emergency Departments

Gabayan GZ, Asch SM, Sun BC/West Los Angeles VA and UCLA, LA, CA; Veterans Affairs Palo Alto Health Center, Palo Alto, CA; Oregon Health and Science University, Portland, CA

Study Objectives: Hospitalizations that occur shortly after emergency department (ED) discharge may indicate opportunities to improve ED care. There currently is limited population-level information about such events. In this hypothesis-generating analysis, we identified hospital- and visit-level predictors of 7-day unscheduled hospital admission after ED discharge.

Methods: We conducted a retrospective cohort analysis of adult (age ≥ 18 years) ED visits resulting in discharge from all non-federal California hospitals in 2007. The primary outcome was unscheduled hospital admission within 7 days of